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ABSTRACT

Four interval studies were conducted to examine possible developmental and transitional stages of efficacy in a teacher education program. Data were collected from 57 student teacher candidates at the beginning of their senior year. During student teaching 46 students (81 percent) participated, and during the beginning teacher year 35 first-year teachers (76 percent) participated. Four instruments were tested and employed to assess educational beliefs and preparation attainments, and student teacher and teacher efficacy. The study showed that these students did not view teaching in relation to preparing and managing students. At the preservice level, the development of pedagogical knowledge and skills appeared to mean successful performance. When the candidates were placed in classroom settings, some facets of efficacy developed during the program were strengthened. Yet, a lack of confidence to discipline students during student teaching was also felt during the beginning teaching year. The findings suggest that a high sense of efficacy begins early in teacher preparation programs. The results also suggest that there are developmental stages of teacher efficacy and that teacher candidates only experience perfunctory behaviors at the preservice level. (JD)

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Does Teacher Efficacy Begin With Teacher Education: Implications from Student Teacher Candidates

by

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November, 1989

Paper presented at the annual meeting of Mid-South Educational Research Association, Little Rock, Arkansas.

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INTRODUCTION

Teacher education programs have benefitted greatly from a large body of knowledge from research studies on teaching. For two decades two types of research studies on teaching have dominated the literature. Process-product research studies have examined teaching behaviors in relationship to student achievement in various contextual settings and across various subject and grade levels (Brophy, 1979; Brophy & Everton, 1981; Evertson & Emmer, 1982; Rosenshine, 1976, 1979). Empirical findings from these studies have yielded a conceptual knowledge and understanding of classroom events and processes in relationship to how teachers can influence student learning. We now have some scientific understanding of what instructional processes are needed, and how they can be performed effectively to accomplish desired student achievement results (Brophy & Good, 1986).

The other line of teaching research has resulted from experimental studies. Such treatment studies have presented causal explanations of specific teaching behavioral effects on student achievement in different contentual settings and across different subject and grade levels (Aspy, 1969; Clark et al., 1979; Clasen, 1983; Crano & Mellon, 1978; Good & Grows 1979; Ryan, 1973; Tobin, 1986).

With this growing knowledge about classroom events and instructional processes, teacher education programs have been guided as to how to prepare teachers more effectively. It is evident from reform movements that teacher education programs have become more comprehensive and clinical to meet demands for quality teaching. No longer can teacher candidates simply enroll in preparation courses, student teach, and graduate. Rather, they must successfully undergo perservice preparational phases that will develop pedagogical content knowledge and methods.

The context of many teacher education programs now include some type of clinical and/or field experiences that enable students to develop and master preteaching skills prior to student teaching (Bischoff et al., 1988; Egbert, 1985; Krustchinsky & Moore, 1981; Peseau et al., 1987). Presumably, by the time students begin student teaching, these preteaching experiences will effectuate in student teaching competency and success (Haberman, 1983). Purportedly, subsequent student teaching competency and success will effectuate with beginning teaching experiences (Berliner, 1985; Griffin et al., 1985).

There seems to be two underlying assumptions from these reforms in teacher education. The first is preteaching preparation at the preservice level will effectuate effective teaching. The second assumption is what teachers

do in actual classroom settings mirrors preparation received in teacher education programs. However, a faulty assumption from these generalizations is all preservice students who undergo these reform changes and complete their program will become effective teachers.

A common concern throughout the literature is the issue with assessing teacher program effects on teaching. It is obviously clear that teacher education programs can make a difference with teachers' instructional processes. It can hardly be argued that teacher preparation is a prime determinant of effective teaching. What is unclear, however, is how to substantially measure program effects on teaching practices.

MEASURING TEACHER EDUCATION PROGRAM EFFECTS

Research on program effects on teacher candidates is far from being replete, because there are a number of research and evaluation issues associated with measuring preservice preparation in relationship to teaching effectiveness.

One problem stems from the criterion that is frequently used to measure teaching effectiveness. Since effective teaching behaviors are defined and measured in relationship to student achievement, it is difficult to examine how

teaching differences may be attributed to preservice preparation. Parenthetically, there are very few large-scale studies that show longterm preservice effects even with effective teachers (Evertson et al., (1985). Yet, the predicted teaching success of teacher candidates continue to be measured with personal and academic factors that are used as program entry and exit criteria (Andrew, 1983; Book et al., 1984). However, these factors are infrequently used with teacher evaluations of performances.

Another problem stems from measurements of program effects with followup studies. Many of these survey studies simply describe teacher graduates' attitudes and perceptions of their preparation program. Parenthetically, even with limited longitudinal followup studies, preparation effects have not empirically shown longterm effects in actual classroom setting. Teacher program evaluation model studies frequently lack qualitative results (Koehler, 1985).

Given these unresolved program assessment problems, it has been difficult to determine specific program effects on teaching behaviors. More importantly, teaching effectiveness research has been unclear as to why some teachers are able to perform effectively, while others are not.

TEACHER EFFICACY STUDIES

There is some evidence from another body of recent teaching studies that show student behaviors are not only influenced by teaching behaviors, but teacher efficacy as well. Teacher efficacy studies have found teachers' sense of efficacy to be significantly related to student achievement (Ashton & Webb, 1982; Ashton & Webb, 1986; Dembo & Gibson, 1985; Denham & Michael, 1981; Gibson & Dembo, 1984).

Employing the pioneer efficacy works of Bandura (1977), the theoretical constructs of self-efficacy have been examined within the teaching context (Greene et al., 1988); Midgley et al., 1988; Miller, 1988; Tracz & Gibson, 1987). According to Bandura (1986), perceived self-efficacy is defined as people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances. In other words, not only does a person need to believe that certain behaviors will effectuate certain outcomes, he/she must believe also in his/her capability to perform these behaviors in various situations. Bandura views this action-outcome relationship as a significant determinant of performances that operate partially independently of underlying skills. Outcome is defined as the consequence of the act. While a person may possess the necessary subskills for expected consequences,

he/she may not associate himself/herself to the bahavioral consequences, especially in diverse situations.

When this premise is applied to teaching, the construct of teachers' sense of efficacy is viewed as an expectancy contruct (Ashton & Webb, 1986) with two independent dimensions: (1) personal teaching efficacy and (2) teaching efficacy. Whereas the personal dimension is as an assessment of one's teaching competencies, teaching efficacy is expectancy of what will occur with learners as a result of certain teaching behaviors. Most teacher efficacy studies have been conducted with this expectancy construct (Midgley, Feldlaufer & Eccles, 1988). A teacher with a high sense of efficacy not only believes that teachers can make a difference, but he/she demonstrates this belief with certain behavioral subskills as well. Consequently, a sense of high efficacy will persist with teaching efforts with low-achieving students. On the other hand, to believe that effective teaching makes a difference with student achievement will not cause teachers to be effective, if they are dubious about their ability to develop, master, and perform effective teaching behaviors.

IMPLICATIONS FOR TEACHER EDUCATION

From teacher efficacy studies, it is unclear as to how effective teachers developed a high sense of efficacy. If there is a strong possibility that a high sense of teaching efficacy is linked to effective teaching and student achievement, more research is needed to understand how teaching efficacy is developed.

According to Bandura (1986), self-efficacy emerges as a result of developmental experiences in one's environment. The more a person experiences environmental effects in relationship to himself/herself, the more a person begins to realize how environmental responses and consequences are a part of oneself. Therefore, if effective and ineffective teaching differences are to be further understood by employing the self-efficacy constructs, how can we best understand where a sense of teaching efficacy begins? Moreover, are there implications that teaching efficacy can be developed at the preservice preparation level? If so, how can teacher preparation programs help teacher candidates develop a high sense of teaching efficacy prior to beginning classroom teaching?

PURPOSE OF STUDY

Employing Bandura's (1986) self-efficacy construct and Ashton and Webb's (1986) teaching efficacy construct, the primary purpose of this study was to examine teacher candidates' self-efficacy in realtionship to their program and beginning teaching year to determine if efficacy could be identified. The secondary purpose was to compare teaching efficacy levels between transitional periods of micro, student, and beginning teaching periods to determine any significant efficacy differences.

The study was divided into four distinct, yet related, preparation and beginning teaching phases: (Phase 1) educational beliefs at the beginning of school term; (Phase 2) attitudes and satisfaction with program knowledge content, skills and microteaching efficacy prior to student teaching; (Phase 3) student teaching efficacy during student teaching, and (Phase 4) teaching efficacy at the beginning of first year teaching.

Ten research questions guided the overall study:

Phases 1 & 2

1. What are the teacher candidates' beliefs about education, schools, teachers, and learners?

2. What pedagogical preparation areas did the participants gain the highest satisfaction?

3. Do participants have a high sense of microteaching efficacy? If so, what are the microteaching factors?

4. Are beliefs significantly related to satisfaction gained from pedagogical knowledge content, skills, and microteaching efficacy?

5. Are program satisfaction levels significantly related to microteaching efficacy? If so, what are the predicted program variables?

6. Can participants' educational beliefs predict preparation satisfaction and microteaching efficacy? If so, what are the program variables?

Phases 3 & 4

7. What are the student teacher efficacy levels?

8. What factors seem to account for student teaching efficacy?

9. Are there significant efficacy differences between microteaching and student teaching?

10. Can microteaching efficacy predict student teaching efficacy?

METHODOLOGY

Subjects

During Phase 1 of the study, fifty-seven (N=57) teachers candidates who were attending a mid-sized southern university were randomly selected for the study. Only teacher candidates who were completing their last year in the teacher program and who were scheduled for student teaching during the second semester were selected.

During the third phase of the program, 81% (N=46) of the participants responded, and 76% (N=35) responded during the last phase. A large percentage (72%) of the sampled group consisted of females, and 59% of the groups was majoring in elementary education. A large majority had GPA's ranging from 2.5-2.9 (38%) to 3.0-3.4 (33%).

Procedures

Four types of data were collected from the participants at four interval periods: (1) beginning of final preparation year in program; (2) prior to student teaching; (3) during student teaching, and (4) beginning teaching. During the first two phases, survey instruments were personally administered. During the last two phases, questionnaires were mailed to respondents.

Instrumentations

Phase 1: Educational Beliefs

Since efficacy constructs have an inherent belief system with requisite skills for desired student learning outcomes, the author designed an educational-related belief questionnaire. The Educational Belief Questionnaire (EBQ), a personal philosophy measure, consisted of 4 subscales related to education, schools, teachers, and learners.

Preliminary versions of scales were revised with item analysis techniques. The final version of EBQ contained 40 item statements. Each subscale was assessed by 10 item statements scored on a 5-point Likert format with responses of strongly agree (5) to strongly disagree (1). Each subscale measured (1) value importance in relationship to expected outcomes, (2) responsiblity in relationship to purposes and functions, and (3) equality in relationship to limitations and freedom. The teacher subscale also measured perceptual image of profession and quality performance, whereas the student subscale also included measures of learning conditions in relationship to achievement ability, background, and teaching influences.

Internal consistency estimates (alpha coefficients) ranged from .72 to .76. Descriptive statistics were used to ascertain mean and standard deviation scores. Belief variables were subsequently examined with preparation

variables in Phase 2, as well as other subsequent phases. Correlational and multiple regression analyses were subsequently performed to determine if beliefs significantly influenced preparation satisfaction and microteaching efficacy. The level of significance was set at .05.

Phase 2: Education Program Satisfaction

For the second phase of the study, the Survey of Teacher Education Program Satisfaction (STEPS), designed by the author, was based on the curriculum goals of the education program. Employing a 5-point Likert format, the instrument contained 41 statements that were divided into three preparational subscales. The first two preparational subscales with 29-item statements assessed the satisfaction level (very unsatisfactory (1) to very satisfactory (5) with pedagogical knowledge content (13 items) and teaching behavioral skills attainments (16 items). Internal consistency for pedagogical knowledge and method satisfaction subscales (Cronbach's alpha) were .76 and .78, respectively.

The third preparational scale was a microteaching efficacy scale with responses on a 5-point scale of strongly disagree (1) to strongly agree (5). Initially, the scale was designed with 20 items with a two-factor model based on literature efficacy studies. However, after a pilot test,

factor analysis eliminated 4 items and three factors emerged: (1) personal effects from microteaching, (2) teaching skill development, and (3) microteaching support influences. This three-factor model differed from the two-model teaching efficacy construct (personal and teaching) cited in the literature due to preteaching differences the preservice level. The scale had an internal reliability score of .73 for the personal dimension of efficacy, .75 for the teaching skill, .69 for the support influences, and .70 for the total 16 items.

A varimax orthogonal rotation revealed the factors were uncorrelated and distinct. A factor loading, >.50 was the criterion used for item inclusions.

In addition to factor analysis, a series of Pearson correlations between pedagogical knowledge, skills, and microteaching were employed. Multiple regression analyses were employed to identify which preparation areas would best explain variations in microteaching efficacy. Regressing each subscale on efficacy enabled the preparation variables of conceptual development to explain as much of the variation in microteaching efficacy as possible. It also indicated the realtive effect of each independent variable on efficacy, while controlling other variables in the subscale. With regression procedures, preparation areas were compared based on at least 23% of efficacy explained.

Phase 3: Student Teaching

The Student Teacher Efficacy Scale (STES), developed by the author, consisted of 31 items divided into four subscales. Initially, the scale consisted of 40 items measuring (1) teaching readiness ability in relationship to program attainments, (2) student teaching efficacy influences in realtionship to expected student teaching outcomes, (3) student teaching ability to perform instructional processes in relationship to expected student learning outcomes, and (4) ability to recognize effective teaching and school environments in relationship to student achievement. After a pilot test and principal-component factor analysis, 9 items were eliminated and 5 factors emerged.

Subscale 1 consisted of 7 items with responses on a 5-point Likert format of agreement (strongly agree (5) to strongly disagree (1)). Subscale 2 had 6 items with 5-point Likert responses form very high (5) to very poor (1), while Subscale 3 asked respondents to identify 10 items as teaching strengths and deficiencies in relationship to classroom tasks on a 3-point scale from high (1) to low (3). The last subscale had 8-item statements with responses strongly disagree (1)). Internal consistencies ranged from .75 to .84 (alpha), and 76 for the total 31 items.

Factor Analysis Procedures: First, a correlation matrix of all the variables was examined. Subsequently a principal-component factor analysis was employed to identify underlying factors. Communality statistics were used with an interation procedure for communality estimates. Eigenvalue statistics were performed to determine factor possiblilites. With a varimax orthogonal rotation, 6 factors emerged: (1) Preparation Subskill Readiness, (2) Efficacy Influencers (3) Effective Discernment, (4) Student Teaching Ability, (5) Teaching Maturation Level, and (6) Teaching Program Reinforcers. A factor loading of > .50 was selected as item inclusion criterion.

Pearson Correlations and Multiple Regressions: Data from previous phases of the study were analyzed with student teaching efficacy to determine any significant relationships and effects. Regression analyses were performed to examine belief and preparation effects on student teaching efficacy. ANOVA was necessary to determine significant efficacy differences between preteaching and student teaching periods. The level of significance was set at .05.

Phase 4: Beginning Teacher

This final phase of the study was interested in examining the participants' efficacy after exiting their

teacher education program. The Beginning Teacher Efficacy Scale (BTES) was developed by the author. Initially, the instrument contained 45-item statements to measure two efficacy factors (personal teaching and teaching efficacy) based on other teacher efficacy studies. However, item analysis analytic procedures employed in this study identified four factors related to beginning teaching efficacy, and eliminated four items after pilot test results.

The revised Beginning Teacher Efficacy Scale consisted of 39-item statements with 4 subscales. Subscale 1 had 12 items measuring self-efficacy in relationship to teaching on a 5-point Likert scale agreement (strongly agree (5) to strongly disagree (1)). Employing a 5-point Likert scale of teaching task ability (very easy (5) to very difficult (1), Subscale 2 had 10 items measuring teaching efficacy in relationship to preparation attainments. Using the same 5-point Likert scale, Subscale 3 had 10 items that measured maturation of teaching efficacy in relationship to student learning. Because literature findings support beginning teacher facilitators, Subscale 4 measured teaching efficacy in relationship to teaching influencers for outcome expectancies (7 items).

A principal-component factor analysis with varimax orthogonal rotation showed factors were uncorrelated and

distinct. A factor loading of > .50 was the criterion selected for item inclusions. Reliability coefficients (Cronbach's alpha) of subscale ranged from .70 to .79. The reliability for the total scale was .71.

Pearson correlations and multiple regression procedures were performed to determine significant efficacy influences from previous efficacy scores. Parenthetically, regression analyses were used to explain variances in beginning teaching efficacy that may be associated with variances in previous efficacy scores. ANOVA was employed to determine any significant efficacy differences during transitional periods. The level of significance was set at .05.

DATA RESULTS

Phase 1: Educational Beliefs

Descriptive Summary

Regardless of economical conditions, the participants viewed education expectancies in relationship to economical benefits and security for them. The sampled group believed one's sex should not exclude him/her from educational training. However, they were unsure about who should benefit from education. The respondents saw schools as places for solving social problems; however, schools had failed to adequately educate people. Teachers, as well as the teaching responsibility, tended to be viewed positively. They saw the teaching responsibility in relationship to parents and students. However, they disagreed that teachers who cannot discipline should not teach. With students, the respondents disagreed that students learn better when they have been trained at home.

Phase 2: Education Program Satisfaction and Microteaching Efficacy

Descriptive Summary

History and philosophy of education and major area of study received the lowest program satisfaction mean scores

(3.3-3.8). The respondents also tended to lack confidence and competency with knowing how to apply instructional methods with exceptional children (3.4) and individual student differences (3.8). This finding was more pronounced with correlational and multiple regression analyses.

Pearson Correlation

Pearson correlations showed that pedagogical knowledge and skills tended to be significantly lower with expected outcomes with students than with performing instructional processes. As presented in Table 1, knowledge and skills are significantly low with exceptional children and student differences. However, if teacher candidates understood teaching (r=.70) and learning (r=.62) methods, they felt confident with instructional goals. It was also interesting to note the participants did not view teaching in relationship to student behaviors that consisted of assessing student learning, responding or motivating students. Rather, students were viewed in terms of what teachers do to prepare and manage students. Perhaps these findings suggest at this preparation phase, the emphasis is on developing the pedagogical knowledge/skills needed for teaching demonstrations. Consequently, students were unable to understand the teacher-student relationship until they experienced the teaching role. At this phase, there did not

TABLE 1

Pearson correlations between preparation knowledge and skills

Preparation Variable	$\bar{X}$	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
KNOWLEDGE																						
1. MajEd	3.8	.82	1.00	.52	.57	.43	.38	.46	.53	.54	.49	.40	.48	.35	.26	.50	.38	.41	.40	.42	.37	.38
2. HisEd	3.4	.76		1.00	.66	.42	.40	.36	.58	.47	.32	.46	.37	.19	.32	.47	.22	.20	.14	.35	.32	.29
3. PhilEd	3.7	.81			1.00	.36	.26	.29	.33	.49	.35	.62	.39	.21	.29	.48	.24	.06	.16	.29	.13	.14
4. TeacMeth	4.4	.74				1.00	.56	.70	.46	.47	.56	.43	.54	.43	.44	.53	.60	.45	.44	.57	.38	.58
5. LearnMet	4.3	.72					1.00	.62	.38	.37	.26	.34	.47	.49	.53	.47	.51	.35	.35	.57	.53	.57
6. GoalObj	4.3	.84						1.00	.53	.43	.43	.37	.53	.45	.48	.70	.78	.56	.53	.51	.55	.65
7. TeaRole	4.4	.77							1.00	.75	.56	.49	.52	.22	.45	.53	.54	.45	.50	.60	.60	.61
8. TeaEff	4.4	.82								1.00	.63	.66	.50	.36	.38	.49	.46	.35	.60	.66	.50	.52
9. MangTch	4.3	.88									1.00	.45	.50	.41	.50	.45	.46	.35	.42	.53	.41	.40
10. Blooms	4.0	.79										1.00	.65	.21	.41	.50	.41	.21	.37	.37	.25	.30
11. TeacEval	4.2	.87											1.00	.47	.56	.54	.56	.41	.54	.55	.47	.44
12. TeacLit	3.8	.83												1.00	.60	.40	.40	.43	.35	.61	.44	.35
13. StudDiff	3.9	.95													1.00	.57	.55	.34	.31	.65	.61	.48
SKILLS																						
14. InstDec	4.3	.83														1.00	.69	.51	.41	.54	.52	.63
15. LesPlan	4.5	.84															1.00	.76	.71	.52	.53	.79
16. WRGoal	4.4	.86																1.00	.73	.40	.43	.63
17. WRObj	4.3	.92																	1.00	.58	.57	.64
18. SelMat	4.1	.91																		1.00	.73	.63

TABLE 1 (continued)

Pearson correlations between preparation knowledge and skills

Preparation Variable	$\bar{X}$	SD	19	20	21	22	23	24	25	26	27	28	29
SKILLS													
19. AsLearn	4.2	.85	1.00	.64	.52	.69	.49	.54	.41	.29	.51	.40	.52
20. PreLesso	4.4	.73		1.00	.64	.67	.54	.44	.40	.26	.46	.48	.47
21. QueStrat	4.5	.73			1.00	.62	.59	.37	.55	.20	.62	.46	.27
22. EngStu	4.3	.82				1.00	.56	.47	.40	.21	.55	.32	.36
23. RespStu	4.3	.76					1.00	.52	.58	.42	.60	.40	.37
24. EvaStu	4.1	.76						1.00	.54	.27	.45	.33	.40
25. MotivStu	4.2	.74							1.00	.26	.51	.50	.30
26. EXChild	3.4	1.20								1.00	.50	.27	.40
27. ObvBeh	4.1	.86									1.00	.68	.49
28. UsEffTec	4.2	.70										1.00	.44
29. UsNVerba	4.1	.77											1.00

N=57

Note. Significance level, $p < .01$ is underlined.

seem to be a relationship between perceived teaching knowledge gained and self-teacher efficacy with students.

Microteaching Efficacy Factor Analysis and Results

Since the teacher candidates had preteaching experiences in microteaching settings, this phase included a factor analysis of the 16 items. Although previous teacher efficacy studies have used a two-factor model to identify efficacy levels (personal and teaching), microteaching efficacy differed somewhat from actual teaching expectancies proposed by Ashton & Webb (1986). As a result, three factors were extracted. Factor 1 accounted for 44% of the variance, while Factor 2 accounted for 10% and 8% for Factor 3. Table 2 shows some results of these 3 independent efficacy factors after an orthogonal varimax rotation was performed.

Factor 1 represents personal dimensions derived from preteaching experiences which indicated how experiences affected the participants. These experiences served as a precursor for subsequent teaching attitudes and behaviors in actual classroom settings. Factor 2 reflects the microteaching effects on development of the teaching professional image in relationship to qualify performances. If the participants observed effective teaching models, they had a high image of themselves as an effective teacher. Th

TABLE 2

Sample items, reliability coefficients, and factor loadings of efficacy scales

Scale	Sample items	N of item	Alpha	Factor loading
Microteaching				
Personal Effects	Having an opportunity to teach my subject major has given me teaching confidence.	7	.73	.54
Teaching Develop.	When I begin student teaching, I will know how to apply inst. knowledge and processes...	7	.75	.66
Support Infl.	It was comforting having my peers as a support team throughout my microteaching exp.	2	.69	.60
Student Teaching (STES)				
Subskill Readiness	I was able to apply college classroon know/ skills..., because I felt responsible for student learning.	7	.78	.60
Influencers	If it had not been for my supervising teacher, I would not have wanted to spend extra time with difficult students.	6	.75	.54
Maturation	When I really tried to understand student behaviors, I was able to manage the classroom to keep students on task.	10	.84	.51
Discernment	The principal demonstrates effective leadership and instructional behaviors.	8	.79	.78
Beginning Teaching (BTES)				
Self-Efficacy	I'm happy being a teacher even when teaching is sometimes difficult.	12	.79	.57
Personal Teaching	When I have low-achieving students, I am able to use teaching techniques that help them excel.	10	.76	.81
Teaching Mat.	If a teacher is sensitive to students problems, some discipline problems can be reduced in classrooms.	10	.70	.75

Note. Subscale 4 (Prog.Infl.) of Beginning Teaching Scale is not included.

last factor was identified as microteaching influences in relationship to microteaching functions to prepare and deliver lessons effectively.

To assess internal consistency reliability with the subscale measures, coefficient alpha was computed: Personal Effects (.73), Microteaching Effects (.75), and Microteaching Influences (.69).

Microteaching Correlations

An examination of correlations between the microteaching efficacy subscale and program satisfaction levels were low. However, intercorrelations among microefficacy measures had significant moderate correlations (Table 3). From the correlations, of the three measures of efficacy, personal effects of confidence and competency were more significantly related to microteaching effects than microteaching influences. The more the participants experienced positive personal effects from microteaching, the more they were able to satisfactorily perform microteaching behaviors. Moreover, correlations between microteaching variables and beliefs about students tended to be low.

Multiple Rregression Results

TABLE 3
Intercorrelations among microteaching efficacy measures

Microteaching efficacy	$\bar{X}$	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. MIReq	4.4	.88	1.00	.72	.55	.48	.13	.43	.45	.38	.38	.26	.10	.49	.42	.79	.38	.45
2. MIRed	4.0	1.04		1.00	.64	.72	.34	.56	.50	.53	.49	.46	.23	.41	.30	.68	.45	.37
3. MIConf	4.3	.81			1.00	.63	.37	.53	.49	.48	.41	.36	.44	.42	.36	.47	.36	.48
4. MIComp	4.2	.93				1.00	.56	.67	.52	.54	.35	.45	.28	.33	.28	.60	.47	.39
5. MiLesson	4.5	.60					1.00	.51	.28	.42	.35	.34	.23	.27	.26	.24	.17	.14
6. MiUnd	4.3	.89						1.00	.66	.52	.41	.42	.33	.26	.29	.57	.34	.51
7. MiMotiv	4.3	.79							1.00	.42	.36	.27	.25	.29	.15	.60	.42	.55
8. MiVal	4.4	.77								1.00	.46	.29	.24	.18	.29	.27	.21	.31
9. MiFeed	4.4	.63									1.00	.41	.40	.21	.25	.46	.21	.29
10. MiQues	4.3	.55										1.00	.39	.26	.21	.34	.30	.31
11. MiSuppor	4.4	.75											1.00	.31	.37	.32	.27	.20
12. MiObserv	4.3	.72												1.00	.68	.52	.52	.34
13. MiSelf	4.3	.75													1.00	.49	.31	.36
14. MiRoles	4.2	.94														1.00	.57	.50
15. MiAppr	4.2	.80															1.00	.49
16. MiEff	4.3	.92																1.00

N=57
Note. Significance level, $p < .01$ is underlined.

Multiple regression analyses were performed to examine which set of belief variables explained the variance in preparation variables. Subsequently, regression procedures were performed to examine which set of belief and preparation variables explained the variance in microteaching efficacy.

While 35% of the variance in education major was due to the variance in education and school beliefs, 41% of the variance was explained by the variance in teacher and student beliefs. The variance in teacher and student beliefs accounted for 34% of the variance in knowledge of instructional decisions.

Of the four sets of belief predictors (education, schools, teachers, students), only schools provided statistically significant increases in the squared multiple correlation (R2) when reduced anxiety, confidence, and competency (personal effects) were selected as the regression criteria. As Table 4 points out, 27% of the variance in MIRED and MICONF was due to school beliefs. Similarly, with another personal effect from microteaching, MICOMP (competency), 65% of the variance was explained by school beliefs. Variances in these personal efficacy effects were also explained by variances in teacher and student belief scores. Not presented in Table 4 are low variances in microteahing efficacy due to the low effect of

TABLE 4

Some results of multiple regressions (R^2) of educational belief predictors of preparation program attainments

Belief Predictors	Multiple R^2												
	Preparation Knowledge/Skills									Microteaching Efficacy			
	Maj Ed	Teac Role	Stud Diff	Teac Meth	Learn Meth	Les Plan	Eng Stud	Inst Dec	Se Mat	MI Req	MI Red	MI Conf	MI Comp
Education	.35*		.36*		.30*					.36*	.27*		
Schools	.35*	.41**				.22	.44**	.34*		.36*	.27*	.27*	.65**
Teachers	.41**			.32*			.31*	.34*	.26	.48**	.23	.23	
Students	.41**									.48**	.22		

N=57
* $p < .05$.
** $p < .01$.

preparation scores. Less than 1% of the variance in microteaching efficacy was explained by preparation scores.

On the other hand, as presented, when some educational beliefs (education, schools, teachers) variables were used as predictors of preparation, the magnitudes of R2 increased. Education and school beliefs tended to account for a significant proportion of variance in teaching skill developments (learning method, student differences, presenting lessons, engaging students). Teacher beliefs also accounted for a significant proportion of variance in teaching skill development. Since previous findings had shown pedagogical correlations to be significantly low with expected student outcomes, it was not surprising to find that variance in beliefs about students accounted for less than 15% of the variance in preparation. This finding was more pronounced when the correlation matrix was examined. While significant intercorrelations were found with microteaching efficacy measures, most of the efficacy measures with beliefs about students were extremely low ($r = .01$ to $.28$).

Phase 3: Student Teacher Efficacy

Descriptive Summary

Although the respondents enjoyed classroom teaching, and viewed themselves as having more teaching strengths than deficiencies, efficacy was hardly perceived in relationship to preparation attainments. Mean scores ranged from 3.0-3.8. It was interesting to find that the respondents' discernment of the school and teachers effectiveness had mean scores of only 3.5 with student desire to learn and teachers enjoying their work with students, and 3.9 with students being motivated by teachers. Yet, the perception was the school climate did increase student learning (4.2).

Factor Analysis Results

Rather than a two-factor model (personal & teaching) commonly employed in teacher efficacy studies, a principal-component factor analysis identified 6 factors with a varimax orthogonal rotation. Eigenvalues revealed that Factor 1 accounted for 22% of the total variances, while Factor 2 and 3 accounted for 11% of the variances. Factors 4 and 5 accounted for 6% of the variance. A factor loading of >.50 was the criterion used for variable inclusions. Only one variable had a communality value of

.63. The communality values for the remaining variables ranged from .70 - .97.

From Table 2, it can be seen that sample items in Factor 1 represented the student teachers' readiness ability to generalize preparation attainments into classroom settings. It was postulated that perceived efficacy must be viewed in relationship with preparation program in which subskills are attained. Consequently, the program operates interdependently with teacher efficacy to obtain expected outcomes with student learning. As a result, teachers must be able to transfer preparation knowledge/skills to classrooms. The items in Factor 2 reflected teaching efficacy influences as teacher candidates transfer into teaching settings. Factor 3 reflected the ability to discern effective and ineffective school environments, while Factor 4 mirrored the personal teaching ability to perform instructional processes. Factor 5 was viewed as the teaching maturation level in which student teachers feel they can control classroom environments to achieve desired outcomes with students. Factor 6 reflected teaching reinforcers from preparation programs that enabled students to discuss and share teaching experiences and problems.

Pearson Correlations

Table 5 shows some correlational results between student teaching ability and program attainments. It seems that the more students were able to see a relationship between program content and teaching, the more they felt they could apply it to classroom teaching situations ($r = .70$, $p < .01$). It also appears that having this knowledge and knowing how to transfer it to classrooms gave teaching confidence.

On the other hand, low correlations between teaching confidence with student differences ($r = .59$, $p < .01$), classroom management ($r = .06$), and decision making ($r = .25$) indicated perceived teaching efficacy is low with perceived difficult classroom situations. It appears when there was a lack of confidence with difficult teaching tasks, the student teachers viewed themselves as unable to change the outcomes.

What can also be seen from Table 5 are student teaching influences of efficacy. Program knowledge application in teaching situations tended to be significantly reinforced with perception of supervisors, coordinators, principals, teachers, and peer student teachers. An unexpected finding was the persistent significant relationship between teacher behavior and principal ($r = .61$, $p < .01$), as well as the

TABLE 5

Pearson correlations between student teaching efficacy measures and program attainments

Student Teach	$\bar{X}$	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. KNTranfe	3.8	1.03	1.00	.70	.65	.45	.29	.05	.19	.24	.37	.21	.23	.35	.07	-.32	.12	-.17	-.05	-.04	.01	-.05
2. TranfClas	3.9	1.00		1.00	.67	.66	.18	-.05	.34	.45	.27	.30	.45	.30	.16	-.20	.11	-.08	-.12	-.05	-.06	.03
3. TeacConf	3.6	1.09			1.00	.59	.40	.09	.42	.33	.34	.30	.34	.15	.06	.25	.02	-.19	-.02	-.02	-.20	.04
4. StuDiff	3.8	.98				1.00	.22	-.10	.30	.40	.43	.18	.48	.25	.02	-.35	-.05	-.13	-.38	.03	-.06	.19
5. FIPrep	3.5	1.10					1.00	.37	.30	.24	.27	.25	.33	-.00	.05	-.12	.02	.04	.15	.31	.19	.10
6. MIPrep	3.0	1.09						1.00	50	.04	-.16	-.10	.18	-.19	-.02	.02	.08	.21	.19	.01	-.01	-.10
7. SemPrac	3.7	1.00							1.00	.14	.14	.15	.49	-.13	.12	.12	.03	.10	-.02	-.12	-.13	-.17
8. Superv	4.7	.73								1.00	.29	.43	.44	.24	.21	.14	.09	-.13	.19	-.15	-.04	.06
9. Coordin	3.4	1.02									1.00	.26	.34	.31	-.18	-.15	.12	-.05	-.12	.03	.03	.11
10. Principa	3.7	1.11										1.00	.52	.33	.20	.23	.18	-.04	.07	-.01	.11	.17
11. Teachers	4.1	.90											1.00	.30	.21	.15	.13	-.11	-.07	-.08	-.19	-.07
12. PeerTeac	4.1	1.00												1.00	-.03	.12	.11	-.13	.10	.07	.09	.10
13. ClassMgt	1.4	.49													1.00	.30	.20	.10	-.02	-.11	-.03	-.03
14. Decision	1.3	.45														1.00	-.05	.11	.10	-.11	-.03	-.11
15. Presenta	1.3	1.50															1.00	-.08	-.02	-.15	.23	-.11
16. Motivati	1.6	1.07																1.00	-.01	.09	.10	.04
17. Knowledg	1.1	.32																	1.00	-.28	-.21	-.11
18. Method	1.4	.49																		1.00	.51	.42
19. TimeMgt	1.3	.46																			1.00	.16
20. Question	1.3	.47																				1.00

TABLE 5 (continued)

Pearson correlations between student teaching efficacy measures and program attainments

Student Teaching	$\bar{X}$	SD	21	22	23	24	25	26	27	28	29	30
21. Assess	1.2	.42	1.00	.27	-.05	-.01	.04	.08	.01	-.06	-.08	-.07
22. Differen.	1.3	.45		1.00	-.18	.10	-.09	-.01	-.08	.10	-.13	-.10
23. Princ	4.3	.94			1.00	.61	.30	.27	.25	.10	.72	.48
24. Teacher	4.5	.68				1.00	.35	.32	.35	.33	.46	.42
25. Student	3.5	1.00					1.00	.59	.39	.12	.26	.39
26. TeacMoti	3.8	.90						1.00	.33	.26	.18	.31
27. EnjTeach	3.8	.88							1.00	.59	.45	.37
28. EXTime	3.5	1.10								1.00	.23	.27
29. CommPrin	4.3	.90									1.00	.63
30. SchClima	4.2	.80										1.00

N=46

Note. Variable 31 (other) was omitted.
Note. Significance level, $p < .01$ is underlined.

communication between principal and teacher ($r = .72$, $p < .01$). Moreover, much of the school climate effectiveness was significantly attributed to the principal ($r = .48$, $p < .01$), as well as the communication with principal ($r = .63$, $p < .01$) and the teacher ($r = .42$, $p < .01$).

Another unexpected finding was the student teachers saw themselves more in relationship to those who were in the same school environment ($r = .78 - .91$, $p < .01$), rather than those at the university level ($r = .65 - .74$). The dominant influences of teaching confidence was positvely and significantly related to other teachers ($r = .75$) and peer student teachers ($r = .94$). Data findings also show the more program knowledge/skills were attained, the less dependence on coordinators at the university level ($r = -.75$). What the data suggest is when the program knowledge for handling difficult situations is missing, a dependency in area is needed. For example, when there was a lack of teaching confidence to handle a difficult situation, coordinators tended to be needed more. With student differences, there was a positive relationship with coordinators ($r = .85$, $p < .01$). The more confident and competent with teaching methods and student differences, the less for depending on supervisors ($r = -.82$) and teachers ($r = -.76$).

On the other hand, it appears if student teachers are motivated by supervisors with whom they have daily contacts, they can feel responsibile for motivating students ($r = .70$, $p < .01$). Findings also suggest if there is supervisory and teacher support, student teachers can understand how the principal ($r = .82$, $p < .01$) and teachers ($r = .88$, $p < .01$) affect student learning. Yet, there was a low significant correlation with school climate ($r = .32$, $p < .05$) which implies confidence was gained in the program, not after the students entered the school environment. In fact, what appears to be a part of the efficacy development is when teacher candidates continue to engage in ongoing program practicums and seminars that will enable them to discuss and share teaching experiences and problems with professors and peers ($r = .70$, $p < .01$).

Multiple Regression Results

Multiple regression procedures were performed with preparation attainments as the predictors and teaching maturation as the criterion. The results indicated hardly any variability in task teaching ability accounted for by preparation attainments. However, when teaching maturation served as the predictor of effective discernment criterion, R2 values were different. The variability in school effectiveness with principal accounted for 36% of the

variance in teaching maturation (classroom management). R2 values with program preparation predictors and student teaching influencers were even higher. The variability in supervisor accounted for 92% of the variance in program attainments. These findings strongly suggest while principals play an important role with reinforcing student teaching efficacy, efficacy is more important with supervisors who share classroom experiences with the student teachers. Perhaps, the student teachers saw the assigned teacher as a mentor.

Phase 4: Beginning Teacher

Descriptive Summary

Descriptive data revealed that the highest beginning teacher efficacy scores were with personal teaching attitudes as a beginning teacher. Generally, the respondents were happy (4.1) and satisfied with teaching (4.4). However, compared to other professions, teaching was not perceived as prestigious (1.6). Except for efficacy with knowledge of subject (4.1), other efficacy mean scores ranged from 3.2 to 3.9). Of these efficacy mean scores, student discipline and discipline techniques (3.2) were the lowest efficacy measures.

Factor Analysis

To confirm and explore factors associated with beginning teacher efficacy, a principal-component factor analysis was performed with a varimax orthogonal rotation. A four-factor model emerged with Factor 1 accounting for 19% of the total variance, while Factor 2 accounted for 15% of the total variance, and Factor 3 accounted for 14%. Factor 4 accounted for 9% of the total variance. Only item loadings of >.45 were included.

From Table 2, it can be seen that Factor 1 is perceived self-efficacy as a teacher. If one is to have a high sense of teacher efficacy, this belief must operate interdependently with self judgments as a teacher. Factor 2 reflects a sense of personal teaching in relationship to acquired subskills that will result in student learning. Factor 3 is described as teaching ability to control the environment or difficult situations. The items in Factor 4, which is not presented in Table 2, reflected the program subskills that operate interdependently with efficacy to obtain expected consequences with students. The preparation subskills are the act that lead to expected outcomes for teaching and learning.

Correlation Matrix Results

To further understand the factor item loadings, the correlation matrix revealed when perceived self-teacher efficacy is high, there is some belief that a high sense of personal teaching and teaching ability to control can occur ($r = .64$, $p < .001$). On the other hand, several significant negative correlations between teaching ability to control classrooms and subskills tended to indicate matured teaching ability is perhaps not obtained from preservice training. Rather, this teaching maturation can occur at the inservice level.

Pearson Correlations

Personal satisfactions from teaching were significantly related to the ability to perform instructional tasks. A strong positive relationship was found between the teaching ability to control and respond to student outcomes ($r = .97$, $p < .01$). This, coupled with the finding of giving more attention to difficult students ($r = .94$), supports the belief that teacher efficacy development is learning how to control the environment for desired teacher and student outcomes. Student teacher confidence was significantly related to beginning teacher self-confidence ($r = .52$, $p < .01$). Moreover, the teaching maturation indicators from

student teaching (classroom management and decision making) tended to be highly related with beginning teaching ability of individual differences, responding to students, and applying discipline techniques.

Multiple Regression

To further understand the influence of student teaching efficacy on beginning teaching efficacy, multiple regression was employed. It appears, as Table 6 shows, the variance in beginning teaching ability to influence student learning was accounted for by 60% of the variance in preparation transfer application in student teaching. Other regression findings also indicated that if student teachers had successful teaching experiences with instructional processes that led to expected student outcomes, this experience was transferred to beginning teaching situations. This finding is more pronounced when observing the variances in other beginning teaching variables of classroom control and student discipline that were accounted for by variances in some student teaching variables. Furthermore, the variance in classroom control was accounted for by 26% of the variance in teaching strengths and deficiencies, and effective discernment. Preparation subskill readiness from student teaching tended to explain the largest amount of variance in beginning teaching efficacy measures.

TABLE 6

Some results of multiple regressions (R^2) of student teaching predictors of beginning teaching

Student Teach Predictors	Beginning Personal Teaching				Teaching Ability (Maturation)	
	Infl	Resp	Asses Learn	Stu Learn	Class Contr	Discip Stu
Teaching Subskills	.60**	.45*			.37*	.38*
Teaching Ability			.74**	.41*	.26*	.67**
Effective Discern.	.33*	.32*			.64**	.46*

* $p < .05$.

** $p < .01$.

Student teacher efficacy measures of teaching maturation seem to also explain the variability in beginning teacher efficacy measures in relationship to outcomes. In fact, because the proportion of variance in beginning efficacy measures tended to increase with student teaching efficacy measures, an extended analysis was employed to possibly understand direct or indirect effects of teaching efficacy stages on beginning teaching.

ANOVA Results

Repeated measures of ANOVA were performed with efficacy scales to determine the effects of each efficacy dimension on teaching transitional periods. To test any significant mean differences between preparation attainments and microteaching experiences, the effects of preparation on microteaching were examined between group scores. The results revealed that preparation knowledge of teaching and learning methods had a greater statistically significant effect on microteaching measures than other preparation variables for groups with high scores (4,5). The effects of TeacMeth and LearnMeth on MIReq was statistically significant ($F(1,44) = 3.75$, $p < .05$). TeacMeth and LearnMeth also had a significant effect on teaching understanding from micro experiences ($F(1,44) = 4.39$, $p < .05$), whereas only TeacMeth had a main effect ($F(1,44) =$

5.83, $p < .05$) on micro lesson presentations. The magnitude effect of TeacMeth and LearnMeth was also great on MiMotiv (micro-motivation techniques) ($F(1,44) = 3.80$, $p < .05$). When the effect of the knowledge of teacher role and effectiveness and managing techniques were examined, F magnitudes decreased. Moreover, having the preparation knowledge of student differences and instructional decisions had no significant effect on microteaching reduced anxiety. It appears that behavioral skills of teaching methods had a greater impact on a sense of teaching efficacy than preparation areas that showed a relationship between teaching and learning.

When student and beginning teaching efficacy differences were examined with group scores, there were no main significant effects of program knowledge on beginning teaching efficacy. F values were extremely low. Similarly, there were no significant effects of student teaching support influencers on beginning teaching efficacy measures ($F(1,16) = .05$, $p = .81$). Surprisingly, the teaching maturation did not signifcantly differ with transitional periods of student and beginning teaching. There were no significant main effects of classroom management and decision-making skills from student and beginning teaching phases ($F(1,30) = .03$, $p = .85$). However, as Table 7 points out, the interaction effects of TeacMeth and TimeMgt

TABLE 7
Results on some main effects of some student teaching variables across beginning teaching variables

Student Teaching	Personal Teaching								Teaching Ability					
	Hap Teac		Like Teac		Infl Stu		Meth Appl		Class Contr		Disc Tech		Disrup Stu	
	MS	F	MS	F	MS	F	MS	F	MS	F	MS	F	MS	F
KNTranfe					.02	.05			.03	.04				
TranClas					.04	.09			.22	.30				
KNTr x TranClas					0	0			1.12	1.52				
TeacConf					0	0								
ClassMgt							.17	.32					.22	.44
Decision							.68	1.29					.21	.41
ClasMgt x Decis							.10	.18					.01	.03
Method							.15	.28					1.41	3.36*
TimeMgt							.30	.57					.01	.01
Method x TimeMgt							.74	1.40					2.60	6.16*
Question							.45	.87					.27	.56
Assess							.17	.32					.01	.02
Question x Assess							.12	.22					.02	.04
MIPrep	.11	.86	12.97	11.52**										
Superv									.01	.01	.11	.11		
Coordin									.13	.24	.28	.27		
Superv x Coordin									.03	.05	.28	.27		

* $p < .05$
** $p < .01$

on beginning teaching ability to discipline students tended to increase F values ($F(1,29) = 6.16$, $p < .05$). Perhaps the data suggest teaching experiences under different conditions do not transfer into beginning teaching settings when the student teacher becomes the teacher.

It was interesting to note while student teacher confidence did not contribute greatly to beginning teacher happiness ($p = .41$), the interaction effect of confidence and microteaching preparation contributed greatly to teacher enjoyment ($F(1, 4) = 11.52$, $p < .05$).

CONCLUSIONS

In an effort to identify possible teaching efficacy levels of the teacher candidates in the study, the findings do strongly suggest that a high sense of teacher efficacy begins early in preparation programs as candidates begin to develop teaching confidence and competency.

It is obviously clear from the data that the curriculum program of teacher education plays a significant role with teacher efficacy development. More importantly, the program design can affect the preteaching experiences that subsequently enable candidates to generalize program effects in teaching situations.

The persistent findings with the candidates' view of teaching were in relationship to the act of teaching or applying techniques, rather than in relationship to student learning outcomes. According to Bandura's (1986), techniques are the consequences, rather the means for the desired outcomes. Therefore, a high sense of teacher efficacy should be viewed with a teaching-learning relationship. This teaching view which appeared to be missing with the teacher candidates in the study, has several implications for teacher education programs. Teacher candidates must begin early with understanding this classroom relationship between teacher and student has to exist. The results strongly suggest perhaps efficacy levels occur at different stages, and teacher candidates only experience perfunctory behaviors at the preservice level. On the other hand, an unexpected finding was teaching efficacy levels remained the same from student to beginning teaching. Perhaps this finding is attributed to the teacher candidates not being adequately adapted to the teaching environment at the time the data were collected. This finding could also infer that while teacher candidates may have a potential sense of high efficacy, this efficacy only matures with longterm teaching experiences. Yet, this finding does not suggest teacher education programs are unable to contribute to efficacy development and growth.

What it does imply is teacher education programs must be designed, not only with teacher knowledge content, but with preteaching experiences that allow students to experience difficult teaching situations. In fact, the student teaching phase is where efficacy interventions can be used for potential beginning teaching deficiencies.

By no means has this study exhausted exploratory means to understand how teacher preparation effects contribute to teacher efficacy. It is obvious to the researcher that a more extensive study is needed to followup on teacher candidates after they have had at least a year or two teaching experience. There is also a need to collect observational data from teacher candidates throughout microteaching, student, and beginning teaching stages. Moreover, since the results strongly suggest the influence of principals on teacher efficacy, this efficacy relationship should be further examined.

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